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OCT 16 1996

Federal Communications Commission
Office of Secretary

From: Charles A. Pantuso <cpantuso@hdvision.com>
To: J1.J1(FCCMAIL)
Date: 10/15/96 8:09pm
Subject: FCC-Advanced Television Position

Dear FCC Commisioners,

I sent this to President Clinton and to Bill Gates. We in the TELEVISION industry have very strong feelings about regluations on our industry proposed by the COMPUTER industry. Please take the time to read this and reply.

Sincerely,
Charles Pantuso
Founding Partner, CTO, and Director of Engineering
HD VISION, Inc.

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Mr. President,

The recent John C. Dvorak article in the October 22, 1996 issue of PC Magazine,

http://www.pcmag.com/issues/1518/pcmg0058.htm

was just the most recent of many comments by journalists and other luminaries concerning the proposed Advanced Television System recommended to the FCC for adoption as a new US broadcasting standard. Each of the pundits that finds fault with the proposal before the FCC quotes all of the others, thus by force of numbers and notoriety, giving apparent credence to statements made by people who have no actual experience in any aspect of the television industry. Unfortunately, the decision on what ATV system to adopt will ultimately have a substantial political component and the decision will have to be made by people who do not actually understand the engineering and marketing issues involved, and these people might be impressed by the credentials of these pundits, even though they have no experience whatsoever in the industry that the regulations will affect.

Since the addressees of this open letter do not know me personally, the following short bio is provided to illustrate my experience and bias concerning these issues.

I am a television systems design engineer that has been working in the industry since 1973. Among other jobs, I have co-designed the Broadcast
Centers for CBS's coverage of the 1992 and 1994 Winter Olympics (for which
I received an Emmy award), worked as a Systems Engineer at ABC-NY for eight years, including three Olympics broadcasts (another two Emmy awards) and installation of the Audio-Video equipment for WABC's transmitter atop the
World Trade Center. All of this work involved the current US broadcasting system, known as NTSC.

I have been involved in High Definition Television since 1986, including engineering the first major television project shot in HDTV, a 14-hour mini-series for the Canadian Broadcasting Company. I am a founding partner and Director of Engineering for HD VISION, Inc., which opened for business in March of 1993 in Irving, (Dallas) Texas. HD VISION produces only
High-Definition programming, so I have some experience with the technology.
(1996 Summer Olympics, Superbowl-XXX, Woodstock-94, which was shot only in
HDTV, commercials for P&G, industrials for TCI & TI, musical productions, such as Victor Victoria, Gipsy Kings Live at Wolftrap, Art Garfunkle at
Ellis Island, etc.) I am also an active member of the Society of Motion
Picture & Television Engineers, and was involved in some of its initial
HDTV standards activities. I have, therefore, followed the development of the Grand Alliance (GA) ATV broadcasting system with some interest and technical competence. (See the HD VISION web page:

<http://www.hdvision.com>)

Although there is much hype today concerning the convergence of the
Personal Computer and the Television, there is little to show of successful products in the marketplace. By successful, I feel we must use the television industry itself as a benchmark. The television is ubiquitous. It is in

nearly every home in America. It provides news and information, as well as entertainment and advertising exposure, to all citizens, and it does this at a very reasonable quality level for a very reasonable price.
And although practical videotape recorders were not invented until the mid-50's, if one were to take one of today's modern televisions back in time to the first day of broadcasting NTSC, that TV would receive the pictures and sounds of the day perfectly. This is a tremendous accomplishment - a standard that has served the American public since its introduction with no obsolescence of legacy equipment throughout its many improvements over the years, including color, transistorization, multi-channel audio, and finally digital enhancement. This compatibility weighed heavily on the standards committees, engineers, and companies that paid for the development of the all-digital Grand Alliance Advanced
Television System. The wisdom of this break with tradition of uninterrupted service to the television viewer has yet to be tested in the marketplace, but those involved, after spending hundreds of millions of dollars and many thousands of man-years on research, development, and testing, finally decided that the improvements were worth the incompatibility.

The television industry is a highly-developed system that includes program production, distribution, broadcasting, reception and viewing. Each of these components has been subjected to the ruthless pressures of evolution over the years, and, although the young and immature computer industry thinks otherwise, this evolution has achieved near-perfection. The economic viability of the television industry is dependent on a mass viewing audience. This requires that the cost and quality of production be reasonable by the standards of the producers, that the cost, quality and reliability of reception be reasonable by the standards of the viewers, and that the content and quality of the programming be of sufficient quality to motivate the viewer to purchase the required hardware and commit the time required to watch.

Although some segments of the computer industry are immensely profitable, the overall industry is not nearly as large as the collection of companies that are supported by the television business. Television is already completely compatible with film, as is confirmed by the fact that at least
75% of all prime-time television programs are shot on film. Television is already compatible with computer technology. Modern television plants include very high-speed digital processors for frame synchronization, digital video effects, variable motion effects, digital tape and disc recording, graphics, distribution, audio processing, automation, and accounting. In fact, the television industry is one of the most advanced users of digital processing in the whole arena of computer users. The main reasons that the computer industry finds itself lacking in compatibility with the television industry can be found in Dr. Alvy Ray Smith's CICATS documents themselves. They reveal a lack of experience with real-world video images. In his Glossary he fails to mention Shannon, Nyquist, and filtering. Shannon and Nyquist developed sampling theory during the early part of this century at Bell Labs, and their theories explain why, due to lack of proper filtering, computer images always require much more bandwidth than television images of equal or better quality. The key to high-quality electronic imaging is following the rules of sampling theory. The television industry understands this, and that is why TV stations and
Networks continue to pay $150,000 for Quantel Paintboxes and CHYRON
INFINIT!s, when a MAC or PC running Photoshop would cost much less. This accounts for the relative quiet of television engineers concerning the technical objections of the computer industry. Television professionals suffer with the vagaries of personal computer incompatibility with television on a day-to-day basis, and they certainly understand many of the issues of computer graphics professionals. This is why interoperability between the computer and television industries HAS been addressed by many parts of the Grand Alliance standard. But is this interoperability really necessary for advanced television distribution to viewers?

The television viewer is not the computer user, even though the computer industry would like access to this huge market. And how big would the television audience be if they had to replace their television every two years to be able to watch the latest programs, and if rented and purchased videotapes and laserdiscs had to be upgraded every six months, at half their original cost, or they would not be viewable on the new TV? Although the computer industry is fond of applying Moore's law to all things technical, why is it that the computer I always want to purchase is the same price, year after year? And most new computer software, which is distributed on a few $1 floppy discs or a $1.50 CD-ROM, even though it typically costs more than a good color TV (about $350), cannot even be run on the best computer of a couple of years ago. If a television viewer buys the latest Pro-Scan Digital television and DVC camcorder, it is still completely compatible with all of the other television sets and recorders that he or she owns. And it is capable of reproducing, without exception, every NTSC television program ever made. There would be no television industry if its economies were like those of the computer industry. Because of the ruthless competition of television ratings and advertising rates, most of the money invested in the television industry is used for the production of programs. These programs have precisely ONE chance to achieve market acceptance. Imagine if the computer industry relied on the quality of the first release of ANY of its software.

It is not clear how long American companies will continue to pour billions of dollars into purchasing computers and software in that elusive illusion of increased productivity promised by computers, but PLEASE DON'T LET COMPUTER PEOPLE HAVE ANYTHING TO DO WITH SETTING TELEVISION STANDARDS.
Although they themselves become billionaires, is the public really, truly served by the instant obsolescence and constant upgrading that is the norm in the computer industry?

While I do not believe that the GA system is perfect, particularly where it provides unnecessarily expensive interoperability with the COMPUTER industry, it is the result of a tremendous body of research and development by a well-respected group of experienced TELEVISION industry engineers and scientists.

I have read the CICATS (Computer Industry Coalition for the Advanced Television System) response to the FCC and I have read many of the documents produced by the ATSC (Advanced Television Systems Committee), the ATTC (Advanced Television Test Center), and ACATS (the FCC Advisory Committee on Advanced Television Systems), the group charged with making final ATV recommendations to the FCC. After reading both the CICATS and ACATS documents, one is left with the impression that the CICATS documents are anecdotal in the extreme, and that the ACATS research is based on many person-years and millions of dollars of actual research and development by the US TELEVISION industry. The CICATS proposal is the result of many days of word processing, presenting opinions as facts, and quoting other people presenting opinions as facts.

Incidentally, TELEVISION programs, unlike COMPUTER programs, have substantial life after their initial use. People actually enjoy using them more than once, and producers can continue to garner revenue many years after their introduction. COMPUTER programs on the other hand, as John C. Dvorak often reports in his column, are almost always greeted with a negative reaction when they are initially released, long before they are completed and actually reliably performing the function for which they are advertised, and which seldom can even be run on hardware more than two years old. Of course, as stated earlier, all of the television programs shown on the first day of television broadcasting in the US could still be received on today's modern, digitally-enhanced television receivers.

I am sure that when John C. Dvorak referred to the "Luddite American TV Broadcasters who hate digital" he must have momentarily forgotten the fact that all of the major US broadcasters produce and distribute their programs digitally, using almost-lossless-compression systems where applicable, but retaining the highest digital quality in their archival masters. The most analog thing used by a modern television broadcaster is the 28.8 MODEM used to download the latest version of a personal computer program, hoping that after installation, constant rebooting due to program instabilities and incompatibilities will no longer be required.

Recall your last experience installing new hardware, operating system, or program on your PC, and compare it to the installation of your last TV.
Does Mr. Dvorak really want this industry to improve its presence in Washington so that they can set the standard for TELEVISION broadcasting, even though they have NO EXPERIENCE WHATSOEVER in that industry?

I guess being a billionaire qualifies you to talk to the FCC commissioner about the regulation of an industry in which you HAVE NO BUSINESS EXPERIENCE AT ALL, and which you would like to convert, out of purely altruistic concern for the television viewer, into the largest wrong-headed extension of the computer industry into another field since the ubiquitous use of spreadsheets by the financial community has resulted in a large segment of the US manufacturing sector moving their facilities off-shore.

The American Society of Cinematographers (ASC) is a private club, membership by invitation only, of the people who shoot and light films for theatrical and television presentation. They do not actually represent the entire movie industry as is claimed by many of the computer industry luminaries constantly repeating the ASC's objections to the GA ATV aspect ratio of 16-by-9. I can only assume that the ASC has forgotten a few facts.
First, the original aspect ratio of television was chosen to be 16-by-12 (4:3) to provide compatibility with motion picture film, which, from the time of its creation by Edison and George Eastman (KODAK) in the late 19th century, until television became a great success in the mid 1950s, has always had a 4-to-3 aspect ratio. In fact, the movie industry originally went to wider aspect ratios, not to improve the aesthetic range of expression available to its cinematographers, but to provide a theatrical experience that could not be equaled by the small, boxy television set.

During the mid-50s local theaters almost disappeared as people no longer went to the movies but instead stayed home to watch TV. The film industry went on to create hundreds of different standards from then until today. All of these are all not only incompatible with the two aspect ratios of proposed in the GA ATV system, they are mostly incompatible with the thousands of movie theaters in multiplex cinemas throughout North America, which have essentially a 1.85 aspect ratio, which is pretty darn compatible with HDTV's 1.78 (about 4%.) Most television viewers are quite happy with the existing television presentation of these films. PLEASE DON'T LET THESE PEOPLE INFLUENCE THE STANDARD FOR ADVANCED TELEVISION.

Steven Speilberg has also joined the CICATS group in objecting to the FCC setting a standard, particularly the Grand Alliance standard. At first I was perplexed by his involvement. Since he is such a good director, what would his concerns be? He can work in any medium, and the GA proposal is much better for feature films than the existing television system. Now, I don't know if this has anything at all to do with his position, but I do remember that he is a major investor in DTS, a digital audio distribution format for motion pictures that competes in the marketplace with Dolby
AC-3, the system selected by the ATSC as the audio layer of the new
Advanced TV specification. Maybe if the FCC didn't set a standard, DTS would have a better chance in the marketplace. Who knows?

Competent television engineers do believe, as do the CICATS proponents, that progressive-scan is preferable in the long term to interlace scan.
That is why the ACATS proposal uses progressive scanning for all but two of its modes: the low-end mode that is directly compatible with the existing
NTSC system, and brings the advantages of digital transmission to the millions of existing televisions sets and programs already produced; and the highest-quality standard, which is limited to interlace by the physics of camera design, the Brownian motion of atoms in solid-state devices, and the not unlimited pocketbooks of the people who have to produce television programs. All of the people I have talked to in the television industry believe there will be an eventual migration to progressive, because it makes processing of the television image easier, and even though the computer industry does not understand that this is the case, the television industry processes its images digitally, and constantly. But we cannot simply ignore the deleterious effects of upconversion of interlaced television images to progressive, and then the probable downconversion of these same images back to interlace for display on the hundreds of millions of existing televisions, which, unlike the current crop of PCs, are destined to be around for quite a long time.

We have a huge collection of interlaced High Definition images in our library at the HD VISION studios in Las Colinas. I invite anyone who is interested to come by for a demonstration. You will find, just as EVERY COMPUTER PERSON THAT HAS EVER SEEN THEM HAS AGREED, that they are among the finest images they have ever seen. And the technology exists to produce these High-Definition moving images in volume. There is no production system available for the CICATS proposed system, and since they really didn't produce a specification for a complete television system, only some suggestions for image sizes, frame rates, pixel counts and a desire for NO official standard, it is likely that reasonable quantities of equipment will not be available anytime soon.

Even though all of us in the television industry use computers, and even though we all wish that computers were more compatible with television, to reduce our cost of equipment acquisition, and make our moving-picture experiences with computers as good as our moving picture experiences with television, we must not loose sight of the total industry in which we operate; the producers, the distributors, the manufacturers, and, most importantly, the viewers. We must always do the best technically that will still be affordable, reliable, and wanted by the viewer. We cannot let the computer industry dictate a wild marketplace that will obsolete TVs and television programs every six months. Remember AM Stereo. If watching television becomes as expensive and unreliable as using a computer, there will be no television industry as we know it and the thread of universally accessible information that ties the American Public together will be broken.

If the pundits outside the television industry are successful in lobbying against the ATV proposal currently before the FCC, then can we look forward to computer and movie industry lobbying on Late-Term Abortions, Coal Mine Safety, Beef & Fish Inspections by the FDA, Farm Subsidies, Medical Safety
Regulations, Space Exploration, Air Traffic Control, and many other government functions that only billionaires (and, of course, journalists!) are smart enough to understand?

Thank you for you time.

Regards,

Charlie

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